of a slip of gold leaf. Thus it appears that the substance which possesses the highest chemical affinity manifests also the greatest power of electrical tension.

January 21, 1847.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

Henry Dyke Acland, M.D. was elected a Fellow of the Society.

"On Photographic Self-registering Meteorological and Magnetical Instruments." By Francis Ronalds, Esq., F.R.S., &c.

The apparatus employed by the author at the Kew Observatory, and which he terms the Photo-Electrograph, is described by him in the following words:—"A rectangular box, about sixteen inches long and three square, constitutes the part usually called the *body* of a kind of lucernal microscope. A voltaic electrometer (properly insulated, and in communication with an atmospheric conductor) is suspended within the microscope, through an aperture in the upper side, and near to the *object* end. That end itself is closed by a plane of glass, when daylight is used, and by condensing lenses, when a common Argand lamp is employed. In either case an abundance of light is thrown into the microscope. Between the electrometer and the ether, or eye-end of the microscope, fine achromatic lenses are placed, which have the double effect of condensing the light upon a little screen, situated at that eye-end, and of projecting a strong image of the electrometer, in deep *oscuro*, upon it. Through the screen a very narrow slit, of proper curvature, is cut (the chord of the arc being in a horizontal position), and it is fitted into the back of a case, about two-and-a-half feet long, which case is fixed to the eye-end of the microscope, at right angles with its axis, and vertically. Within the case is suspended a frame, provided with a rabbet, into which two plates of pure thin glass can be dropped, and brought into close contact by means of six little bolts and nuts. This frame can be removed at pleasure from a line, by which it is suspended, and the line, after passing through a small aperture (stopped with grease) cut through the upper end of the long case, is attached to a pulley (about four inches in diameter), fixed, with capacity of adjustment, on the hour arbor of a good clock. Lastly, counterpoises, rollers, springs, and a straight ruler are employed for ensuring accurate rectilineal sliding of the frame, when the clock is set in motion.

"A piece of properly prepared photographic paper is now placed between the two plates of glass in the moveable frame; the frame is removed (in a box made purposely for excluding light), and is suspended in the long case; this is closed, so as to prevent the possibility of extraneous light entering with it; the clock is started, and the time of starting is noted.

"All that part of the paper which is made to pass over the slit in the screen, by the motion of the clock, becomes now therefore successively exposed to a strong light, and is consequently brought into a state which fits it to receive a dark colour on being again washed with the usual solution, excepting those small portions upon which dark images of the lower parts of the pendulums of the electrometer are projected through the slit. These small portions of course retain the light colour of the paper; and from the long curved lines or bands, whose distances form each other, at any given part of the photograph, i. e. at any given time indicate the electric tension of the atmosphere at that time.

"By certain additions to the instrument above described, the kind as well as the tension of electrical charge is capable of being registered; and by the employment also of a horizontal thermometer, &c., it is adapted to the purposes of a *Thermograph*, as well as *Photo-barometrograph* and *Magnetograph*."

January 28, 1847.

LEONARD HORNER, Esq., Vice-President, in the Chair.

"On the Lunar Atmospheric Tide at St. Helena." By Lieut.-Colonel Edward Sabine, R.A., For. Sec. R.S.

The results of the observations made by Captain Lefroy, of the Royal Artillery, Director of the Magnetical and Meteorological Observatory at St. Helena, are here given; from which it appears, on the examination of the barometrical changes during seventeen months, that a maximum of pressure corresponds to the moon's passage over both the inferior and superior meridians, being slightly greater in the latter case, and that a minimum corresponds nearly to the rising and setting, or to six hours before and after the former periods. The average atmospheric pressures are 28·2714 inches in the first case, and 28·2675 in the last; the difference being 0·0039 inch. The height of the cistern of the barometer above the sea is 1764 feet; and the latitude of the Observatory 15° 57′ S. These results were still further confirmed by those of a series of observations during two years. These observations also establish the conclusion that the moon exerts a greater influence on the amount of atmospheric pressure at the periods of her perigee than at those of her apogee.

February 11, 1847.

The MARQUIS OF NORTHAMPTON, President, in the Chair.

The following paper was read:—

"On the Amount of the Radiation of Heat, at night, from the